engcon®

Service Manual

Tiltrotator/Rotator EC/ECR05

The noble art of digging

ec™

Version 1.0

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Safety regulations

General information

Key to terms

In this service manual, the terms CAUTION, NB: and NOTE: are used as follows:

CAUTION

The term CAUTION signifi es that incorrect procedures can cause personal injury.

NB:

The term NB: signifi es that incorrect procedures can cause material damage.

NOTE:

The term NOTE: highlights important user instructions.

The service manual describes the repair and inspection operations that can be performed on tiltrotator/rotator ec 05.

The safety regulations apply regardless of which base machine is used.

Also see the safety instructions for the base machine and other equipment used.

Also see the safety information in the instruction manual.

Make sure you have read and understood all the cautions before undertaking any maintenance operations. The cautions explain potential risks and how to avoid them.

If in any doubt, contact your employer or the supplier. Expert advice can eliminate many unnecessary risks.

Cautions

CAUTION

Incorrect installation can pose a safety risk. If in any doubt, contact an engcon dealer or engcon Nordic AB.

CAUTION

Make sure that the hydraulic system is free of pressure before starting work on the system. Risk of personal injury.

CAUTION

Switch off the power when working with the electrical system and remove rings, watches etc. before starting work. Risk of personal injury.

CAUTION

Never use your hands to check for leaks in the hydraulic system. Hydraulic oil under pressure can penetrate your skin causing serious injury.

CAUTION

Implements connected to the tiltrotator/rotator may not be used under any circumstances unless correctly locked into place. ALWAYS make sure that the lock bolts protrude according to the specifi cations for the relevant quick hitch.

CAUTION

Never attempt to upgrade the equipment's maximum capacity by making modifi cations without the supplier's approval.

CAUTION

Short circuits in electrical cables can cause injury and burning. Insulate electrical conductors and parts carefully when installing electrical equipment.

CAUTION

Risk of burn injuries from hot hydraulic oil.

CAUTION

The machine must never be operated with the implement lock switch turned on, except when attaching or detaching a bucket or implement.

CAUTION

If in any doubt regarding the machinery or the safety features, contact an engcon dealer or engcon Nordic AB.

CAUTION

Risk of catching in moving parts.

Technical data

General information

Max. machine size	6 000 kg
Max. breakout	45 kNm
Max. bucket width	1000 mm
Max. hydraulic pressure	22.5 MPa
Min./max. hydraulic fl ow	15/35 l/min.
Max. rec. pressure in return line	2.5 MPa
Weight	125 kg*
Width A	260 mm*
Width B	215 mm*
Width C	160 mm*
Total length D	485 mm*
Build height E	300 mm*
Max. width	420 mm*
Swivel channel extra function, number of couplings	2
Swivel channel lock function, number of couplings	2
Rotation	Infinite
Tilt angle	2x40°
Tilt time, hydraulic flow	5 s / 7.5 l/min.
Rotation time for one rotation, hydraulic flow	7 s / 24 l/min.
Hydraulic motor Char-Lynn, T line	101 cm3
Standard mountings	S40

*Depends on mounting

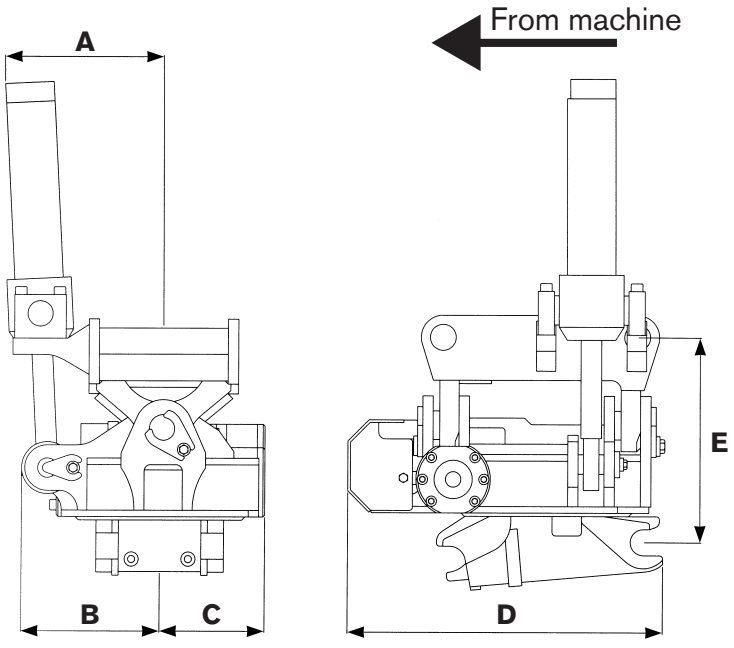


Fig. 1. Measurement table

Tightening

The rotator is dimensioned to withstand heavy strain from breakout and rotation. Tightening of certain screw joints is vital to ensure optimum durability.

Screws and thread holes must be kept very clean and the threads well lubricated.

Screw dimension	8.8 Type	12.9 Type
M5	5.7 Nm	9.7 Nm
M10	47 Nm	80 Nm
M12	81 Nm	140 Nm

The screws for the hitch, centre ring and yoke couplings must be replaced during servicing.

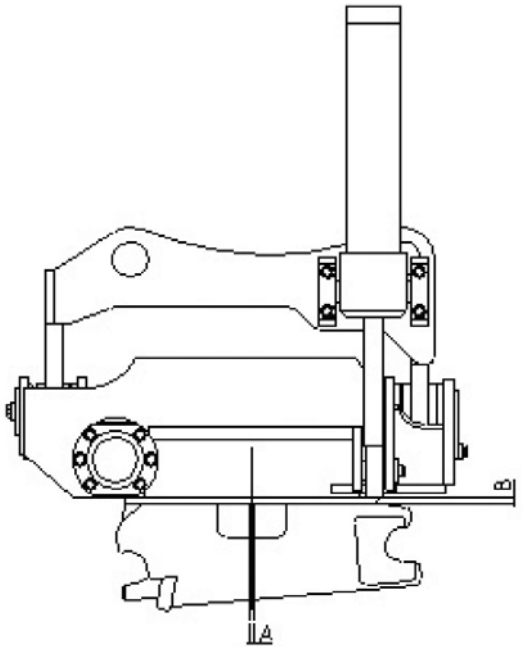
The replacement screws should be of the same type as the previous screws.

Permitted play

Axial play, worm screw A	Axial play, worm wheel B
Max. 0.4 mm	Max. 0.3 mm

NOTE:

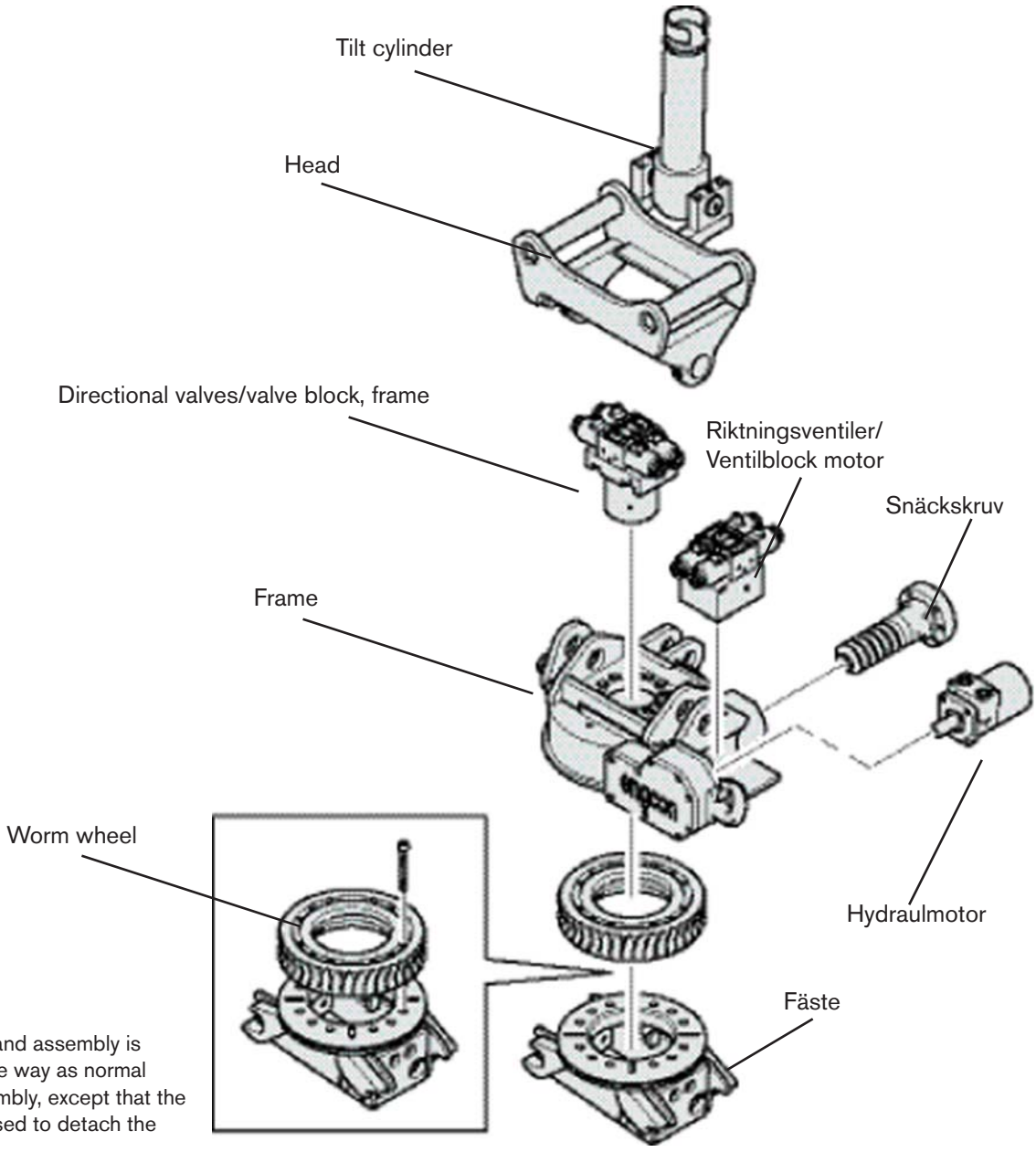
After shimming, the values should be between 0.1 mm and 0.2 mm.



A. Axial play, worm screw
B. Axial play, worm wheel

Fig. 2. Overview, play

Tiltrotator/rotator EC05



Reverse dismantling and assembly is performed in the same way as normal dismantling and assembly, except that the plug in the frame is used to detach the hitch.

Fig. 3. Assembly diagram, rotator EC05

Tilt cylinder

Removal

CAUTION

Make sure that the hydraulic system is free of pressure before starting work. Risk of personal injury.

OBS!

All work that involves opening up connections to hydraulic parts requires a high degree of cleanliness.

1. Clean the tilt cylinder and its hydraulic connections.
2. Mark the positions of the two hydraulic tubes.
3. Disconnect the hydraulic tubes connected to the tilt cylinder.
4. Plug all open connections.
5. Remove the lock screw on the cylinder shaft and remove the cylinder shaft.

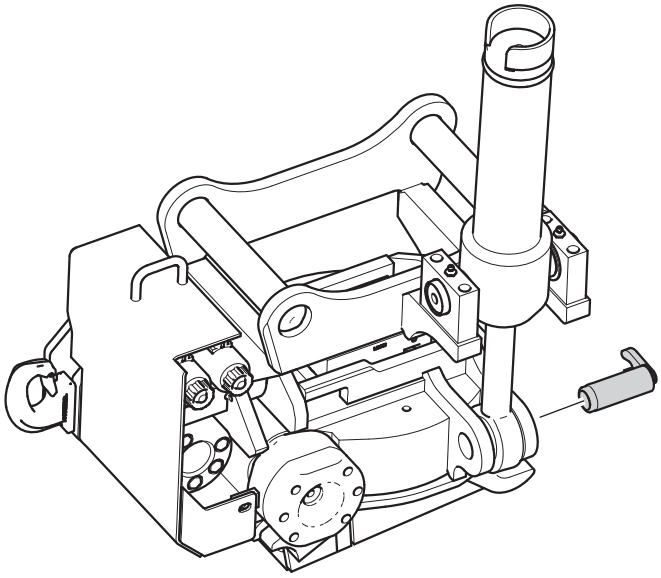


Fig. 4. Cylinder shaft

CAUTION

Risk of catching in moving parts

6. Disconnect the yoke coupling turned away from the machine and remove the tilt cylinder.

Dismantling

NB:

All work that involves dismantling of hydraulic parts requires a high degree of cleanliness.

1. Clean the outside of the cylinder.
2. Clamp the cylinder in a vice.
3. Remove the cylinder nut and empty any remaining oil from the cylinder.
4. Pull out the piston rod along with its seals.

NOTE:

The piston is fi xed with Loctite. If necessary, heat gently to facilitate removal.

5. Remove the piston from the piston rod.
6. Remove the cylinder nut from the piston rod.

Assembly

1. Check the piston rod, piston and cylinder for damage or scratches.
2. Replace all seals.

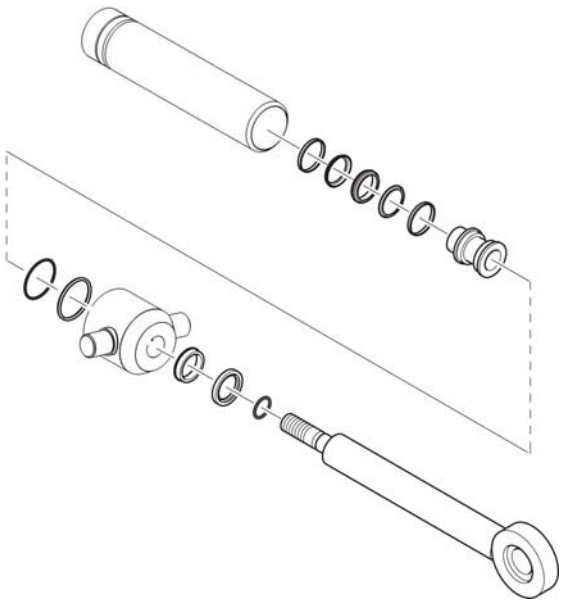


Fig. 5. Tilt cylinder, assembly diagram

3. Lubricate the seals in the cylinder nut with clean hydraulic oil and thread it onto the piston rod.
4. Apply lock solution to the piston and mount it on the piston rod.

5. Make a punch mark on the bottom between the piston and the piston rod to secure the piston.
6. Lubricate the new seals on the piston with clean hydraulic oil and push the piston rod into the cylinder.
7. Screw the cylinder nut into place.

Attachment

1. Attach the tilt cylinder to the yoke coupling that is turned towards the machine.
2. Screw the yoke coupling that is turned away from the machine into place.

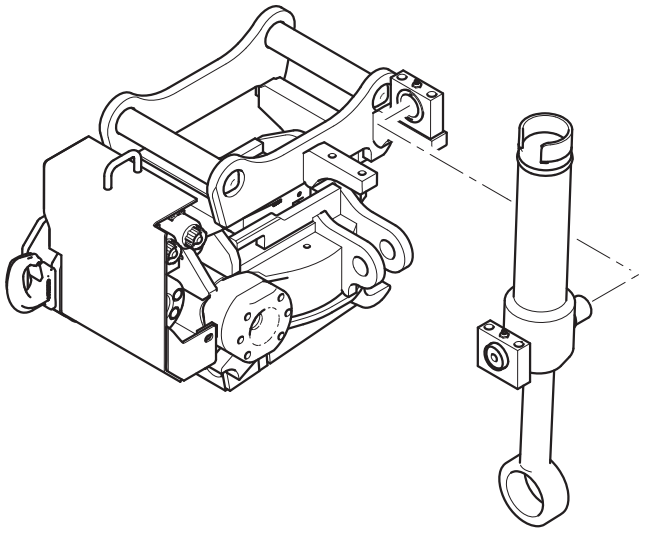


Fig. 6 Tilt cylinder

3. Attach the cylinder shaft and the lock screw.
4. Connect the hydraulic tubes to the tilt cylinder, following the markings made earlier.
5. Lubricate the tiltrotator. See the lubrication schedule in the instruction manual.

Grab cylinder

Removal

CAUTION

Make sure that the hydraulic system is free of pressure before starting work. Risk of personal injury.

NB:

All work that involves opening up connections to hydraulic parts requires a high degree of cleanliness.

1. Clean the grab cylinder and its hydraulic connections.
2. Mark the positions of the two hydraulic tubes.
3. Remove the hydraulic tubes.
4. Plug all open connections.
5. Remove the lock screw for the grab cylinder's shaft.
6. Remove the shaft and the grab cylinder with spacers.

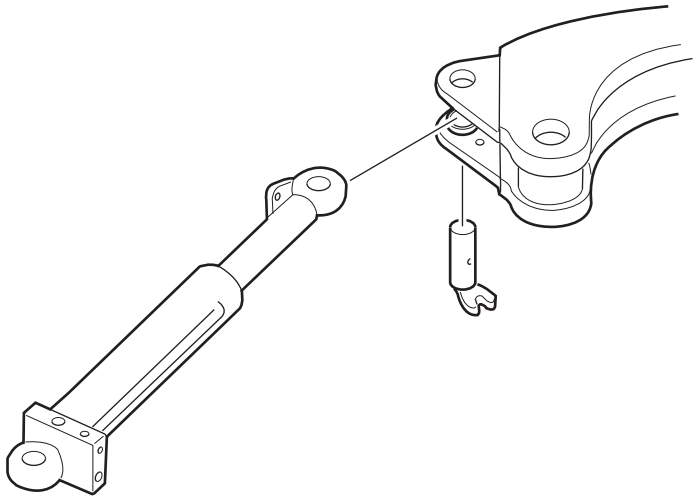


Fig. 7. Grab cylinder

7. Remove the nut for the rear mounting
8. Remove the cylinder.
9. Remove the grab guard.

Dismantling

NB:

All work that involves dismantling of hydraulic parts requires a high degree of cleanliness.

1. Clean the outside of the cylinder.
2. Clamp the cylinder in a vice.
3. Remove the check valve and the plug.

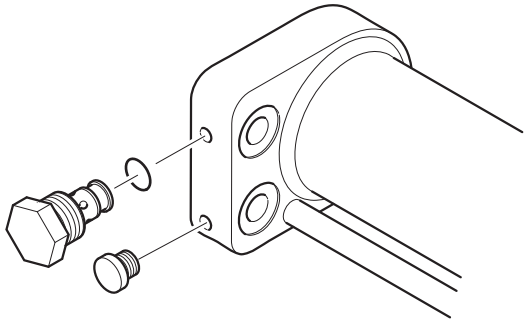


Fig. 8. Plug and check valve

4. Undo the cylinder nut.
5. Pull out the piston rod along with its seals.

NOTE:

The piston is fi xed with Loctite. If necessary, heat gently to facilitate removal.

6. Remove the piston from the piston rod.
7. Remove the cylinder nut from the piston rod.

Assembly

1. Check the piston rod, piston and cylinder for damage or scratches. Replace any damaged or scratched parts.
2. Replace all seals.

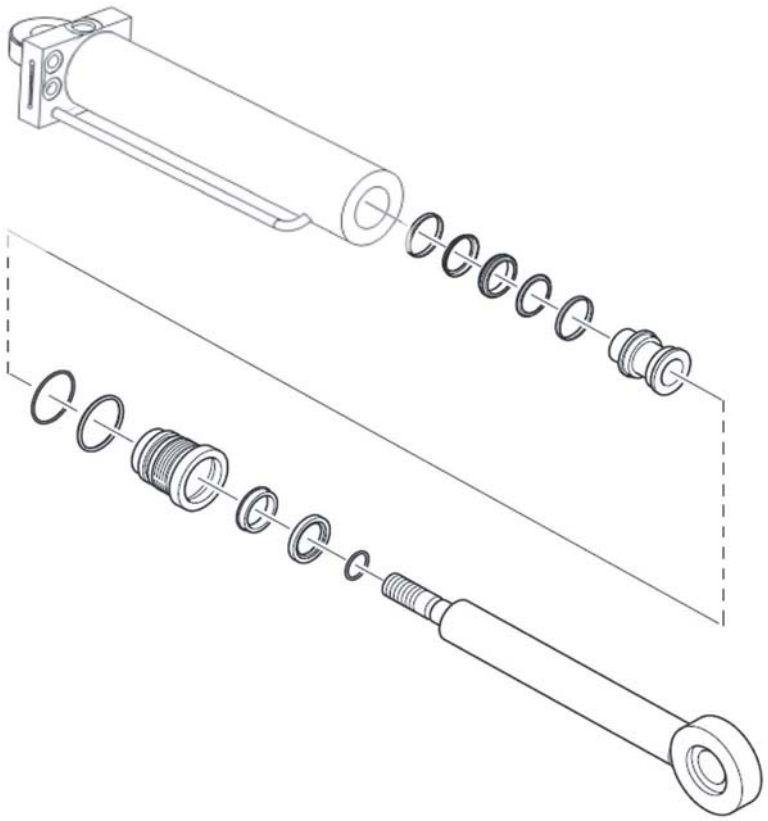


Fig. 9. Grab cylinder, assembly diagram

3. Lubricate the seals in the cylinder nut with clean hydraulic oil and thread it onto the piston rod.
4. Apply lock solution to the piston and mount it on the piston rod.
5. Make a punch mark on the bottom between the piston and the piston rod to secure the piston.
6. Lubricate the new seals on the piston with clean hydraulic oil and push the piston rod into the cylinder.
7. Screw the cylinder nut into place.
8. Attach the plug with a new O-ring.
9. Attach the check valve with a new O-ring.

Attachment

1. Attach the grab guard.
2. Attach the grab cylinder.
3. Attach the nut for the rear mounting.
4. Attach the shaft for the grab cylinder with spacers and a lock screw.

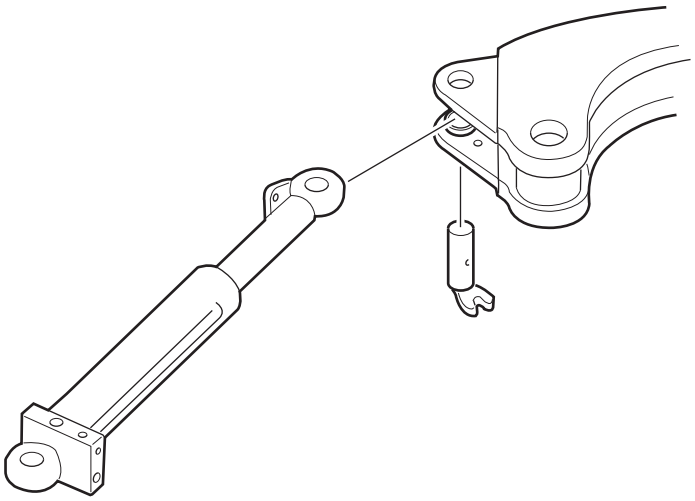


Fig. 10. Grab cylinder

5. Connect the hydraulic tubes, following the markings made earlier.
6. Lubricate the grab cylinder. See the lubrication schedule in the instruction manual.

Directional valve, motor

Removal

CAUTION

Make sure that the hydraulic system is free of pressure before starting work. Risk of personal injury.

NB:

All work that involves opening up connections to hydraulic parts requires a high degree of cleanliness.

1. Remove the motor hood.
2. Mark the positions of the power plugs..

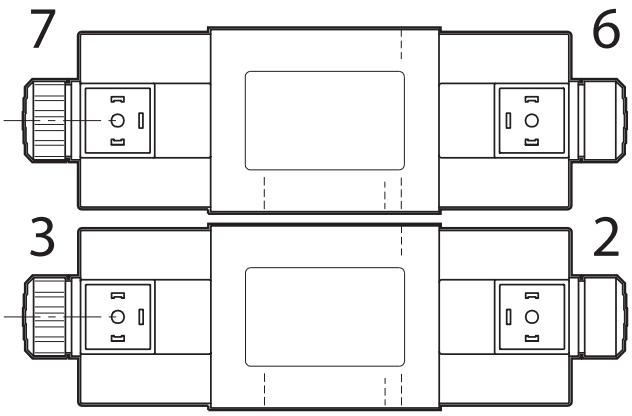


Fig. 11. Marking, power plugs (variations may occur)

3. Disconnect the power plugs on the directional valves on top of the motor.
4. Remove the directional valves.
5. Plug all open connections.
6. Remove the plastic nuts for the electromagnets and remove the electromagnets from the directional valve.

NOTE:

Reserve the O-rings for later.

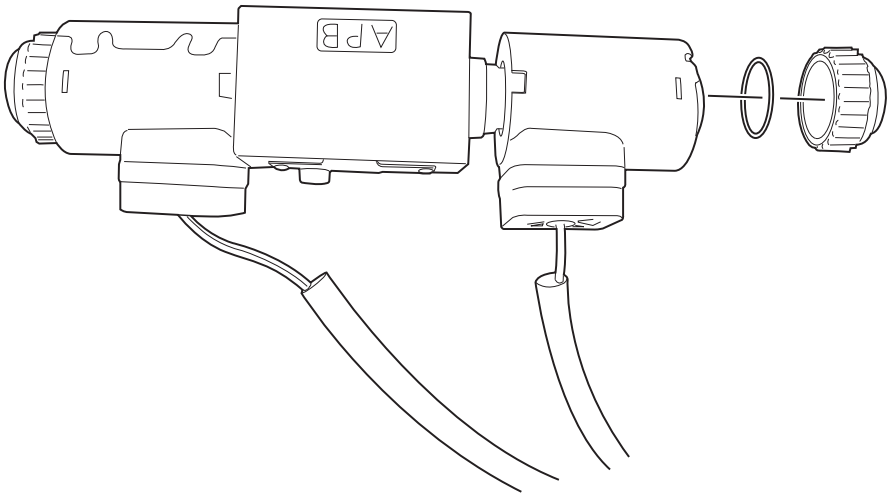


Fig. 12. Directional valve

7. Replace any damaged parts.

Attachment

1. Attach the electromagnets to the directional valve.
2. Lubricate the O-ring, thread it onto the directional valve and attach the plastic nut.
3. Connect the directional valve to the valve block. Check that all the O-rings are correctly in place.
4. Connect the power plugs to the electromagnets, following the markings made earlier.
5. Make sure that the cables are correctly positioned and are not rubbing against any sharp surfaces. Strap them into place with cable ties.
6. Attach the motor hood.

Directional valve, frame

Removal

CAUTION

Make sure that the hydraulic system is free of pressure before starting work. Risk of personal injury.

NB:

All work that involves opening up connections to hydraulic parts requires a high degree of cleanliness.

1. Mark the positions of the power plugs.

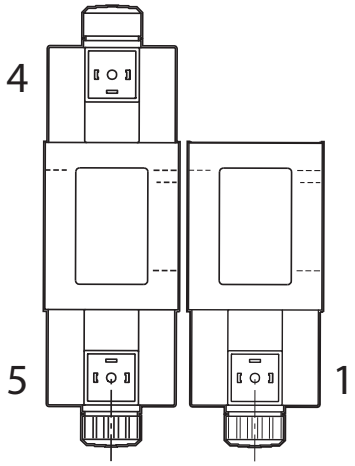


Fig. 13. Marking, power plugs (variations may occur)

2. Disconnect the power plugs on the directional valves.
3. Remove the directional valves from the valve block.
4. Remove the plastic nuts for the electromagnets and remove the electromagnets from the directional valve.

NOTE:

Reserve the O-rings for later.

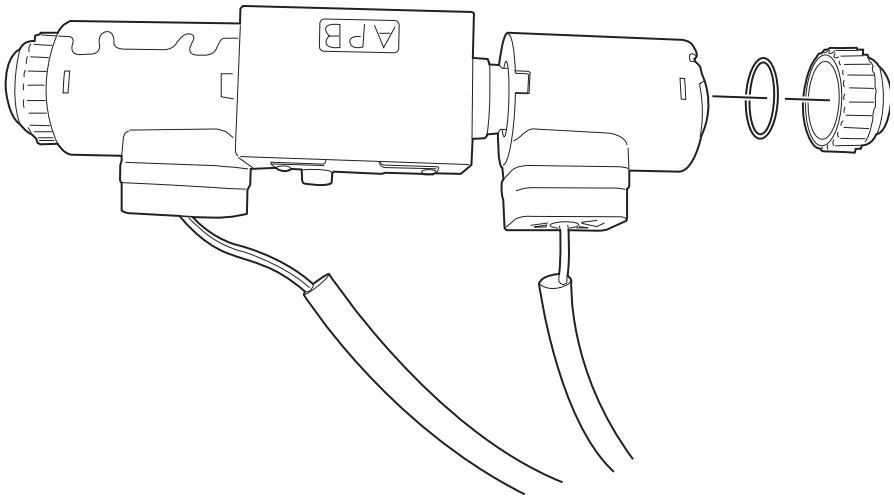


Fig. 14. Directional valve

5. Replace any damaged parts.

Attachment

1. Attach the electromagnets to the directional valve.
2. Lubricate the O-ring, thread it onto the directional valve and attach the plastic nut.
3. Attach the directional valve to the valve block. Check that all O-rings are correctly in place.
4. Attach the power plugs to the electromagnets, following the markings made earlier.

Head

CAUTION

Make sure that the hydraulic system is free of pressure before starting work. Risk of personal injury.

OBS!

All work that involves opening up connections to hydraulic parts requires a high degree of cleanliness.

Removal

1. Remove the tilt cylinder according to the instructions in the section Tilt cylinder, Removal, steps 1–6.
2. Remove the motor guard.
3. Remove the gear housing.
4. Remove the cog wheel in the motor, using a hammer puller if necessary.
5. Remove the four screws on the motor. Lift off the motor with the valve package. Hang it on the rotor to avoid damaging the hydraulic tubes and power cables.
6. Remove the lock screw for the tilt shaft that is turned towards the machine.
7. Remove the tilt shafts.
8. Remove the head.
9. Check the head for cracks and other damag. Replace or repair if necessary.
10. Knock out any worn bushes and replace them with new ones, using a suitable tool.

Attachment

1. Lubricate the bushes for the tilt shafts.
2. Lift the head into place and attach the tilt shaft that is turned away from the base machine.
3. Attach the tilt shaft that is turned towards the machine. Push it in until it reaches the inner edge of the shaft hole in the head.

NB:

Do not use shims on the front end. Risk of material damage

4. Shimsa in överdelen genom att placera shims på insidan i bakkant.

NOTE:

There must be no perceivable play after attachment and shimming.

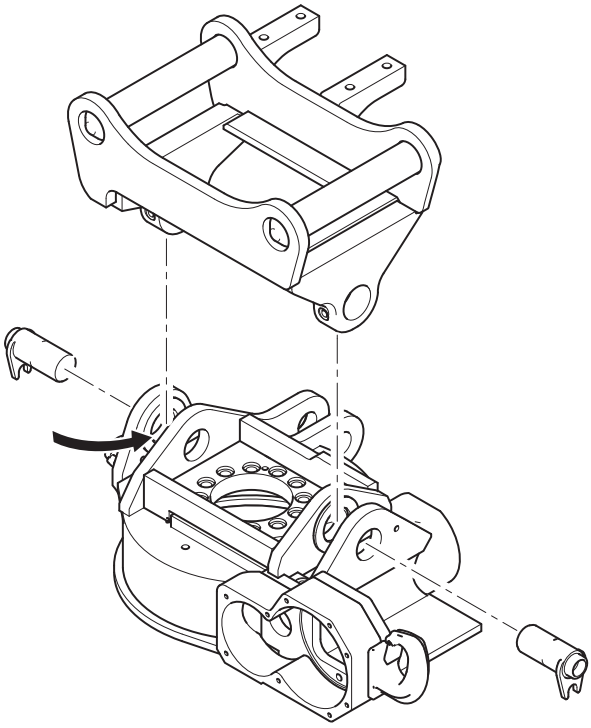


Fig. 15. Shimming, head

5. Attach the lock screws for the tilt shafts.
6. Lubricate the bushes for the tilt cylinder.
7. Attach the tilt cylinder according to the instructions in the section Tilt cylinder, Attachment, steps 1–5.
8. Attach the motor with the valve package.
9. Attach the hydraulic tube from the tilt cylinder's + side to connection B on the motor's valve block.
10. Attach the hydraulic tube from the tilt cylinder's - side to connection A on the motor's valve block.
11. Attach the motor's cog wheel.
12. Attach the gear housing.
13. Attach the motor guard.

Hydraulic motor

CAUTION

Make sure that the hydraulic system is free of pressure before starting work. Risk of personal injury.

NB:

All work that involves opening up connections to hydraulic parts requires a high degree of cleanliness.

NOTE:

Dismantling instructions for each type of hydraulic motor are included with the seal kit when spare parts are ordered.

Removal

1. Remove the motor guard.
2. Remove the gear housing.
3. Remove the cog wheel in the motor, using a hammer puller if necessary.
4. Mark the positions of the power plugs.
5. Disconnect the power plugs on the directional valves.
6. Remove the directional valves and the valve package from the motor.
7. Undo the screws on the motor and remove the motor.

Attachment

1. Attach the motor to the frame.
2. Attach the valve package to the motor.
3. Attach the directional valves.
4. Attach the power plugs on the directional valves, following the markings made earlier.

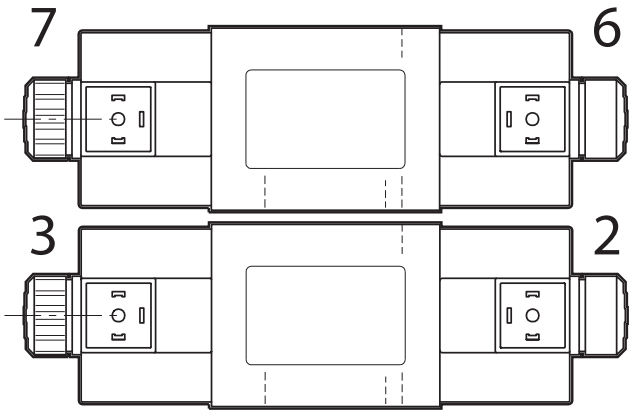


Fig. 16. Marking, power plugs (variations may occur)

5. Make sure that the cables are positioned correctly and are not rubbing against any sharp edges. Strap them into place with cable ties.
6. Attach the motor's cog wheel.
7. Attach the gear housing.
8. Attach the motor guard.

Worm screw

Removal

1. Remove the gear housing.
2. Remove the cog wheel for the worm screw.
3. Remove the screw housing, shims and axial washer.
4. Remove the worm screw.
5. Remove the axial washer and the support ring.
6. Check all wear parts for damage and wear. Replace if necessary.
7. nock out the bushes for the worm screw and attach new ones using a suitable tool.

NOTE:

Replace all seals.

Attachment

NB:

The guide pin in the frame should be aligned with the notches in the support ring and the axial washer.

1. Attach the support ring and the axial washer.

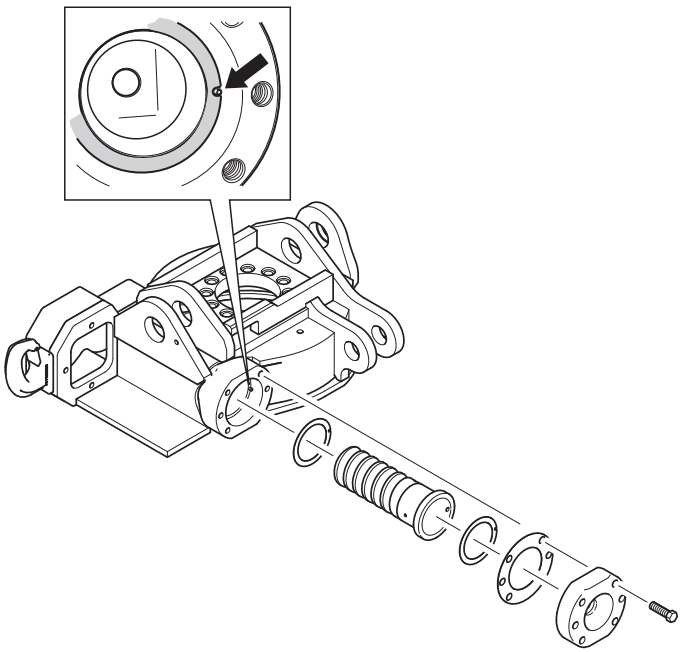


Fig. 17. Guide pin in frame

2. Attach the worm screw. Make sure that the support ring and axial washer do not slip out of place.

OBS!

The guide pin in the screw housing should be aligned with the axial washer.

3. Attach the axial washer, shims and the screw housing for the worm screw.

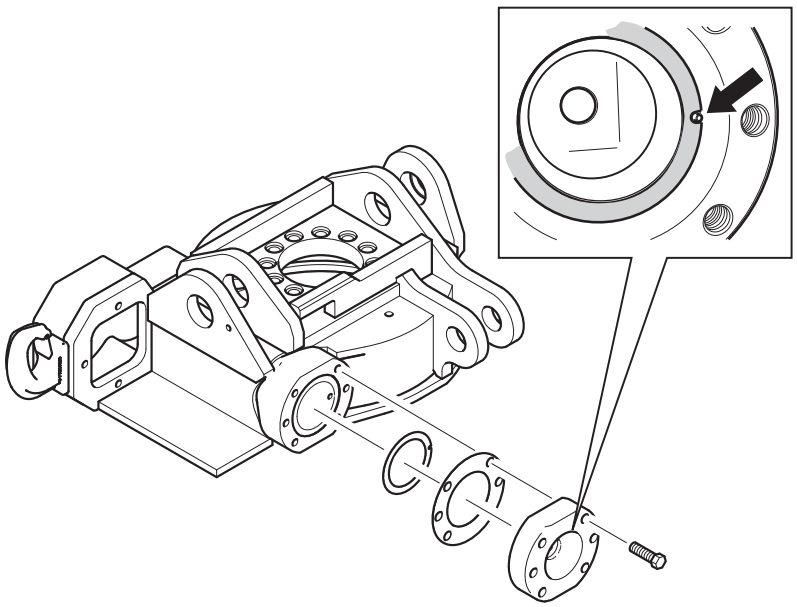


Fig. 18. Guide pin in screw housing

4. Attach the cog wheel for the worm screw.
5. Turn the lower part clockwise to make sure that the worm screw reaches to the bottom.
6. Install the dial indicator and the tool in the grease nipple hole in the screw housing. Set the dial indicator to zero.

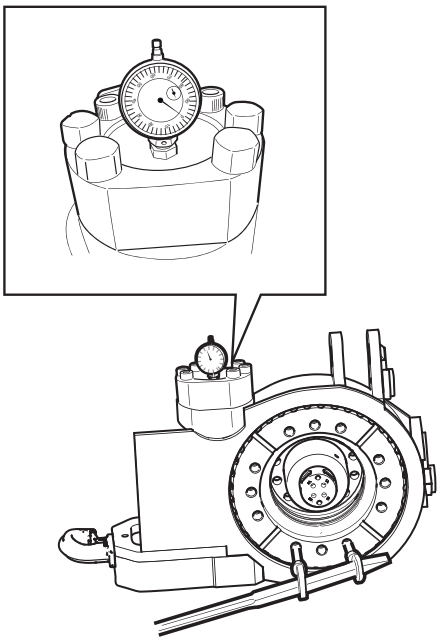


Fig. 19. Installation, dial indicator

NOTE:

When checking the play, make sure that the lower part and frame do not rotate in relation to each other.

7. Turn the lower part anti-clockwise. Check that the play is within the specified tolerance. If there is too much play, the worm screw must be reshimmed.
8. Remove the dial indicator with the tool and install the grease nipple in the screw housing.
9. Attach the gear housing.

Worm wheel

Removal

CAUTION

Make sure that the hydraulic system is free of pressure before starting work. Risk of personal injury.

NB:

All work that involves opening up connections to hydraulic parts requires a high degree of cleanliness.

1. Remove the motor guard.
2. Perform steps 1–6 according to the instructions in the section Tilt cylinder, Removal.
3. Remove the gear housing.
4. Remove the pinion for the motor and worm screw.
5. Mark the positions of the power plugs on the motor's directional valves, then disconnect them.
6. Plug all open connections.
7. Undo the four screws for the motor in the fl ange and remove the motor with the valve package.
8. Remove the lock screw for the tilt shaft that is turned towards the machine.
9. Remove the tilt shafts and lift off the head.
10. Mark the positions of the power plugs on the frame's directional valves.
11. Disconnect the power plugs from the directional valves.
12. Remove the directional valves.
13. Plug any open connections.
14. Mark the hydraulic tubes' positions on the frame's valve block, then remove the hydraulic tubes.
15. Remove the power cables with the hydraulic tubes.
16. Remove the screw housing, shims and axial washer.
17. Remove the worm screw.
18. Remove the axial washer and the support ring.
19. Remove the screws for the lock cylinder.
20. Remove the tool springs by bending them upwards. Hold them firmly in place to avoid losing them.
21. Mark the positions of the hydraulic tubes on the lock cylinder.

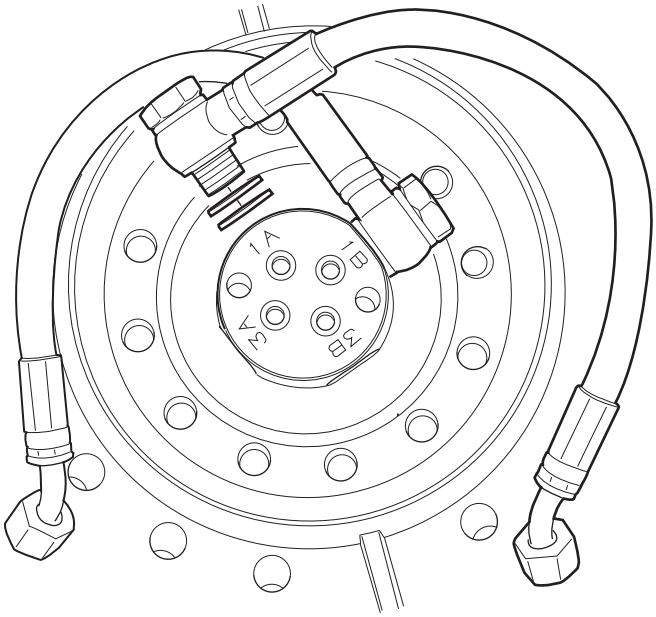


Fig. 20. Hydraulic tubes, swivel

22. Disconnect the tubes and lift it off .
23. Remove the carrier grab. It should be facing outwards between the B outlets.

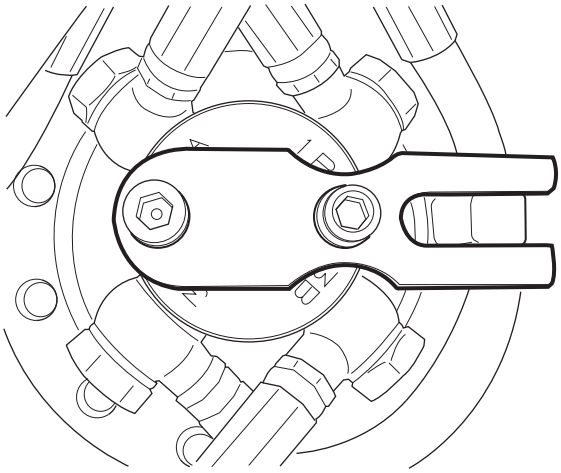


Fig. 21. Carrier grab

24. Disconnect the tubes for extra equipment on the hitch.
25. Plug any open connections.
26. Undo the screws for the hitch and remove it.
27. Mark the positions of the hydraulic tubes on the swivel and disconnect them.
28. Plug all open connections.

NB:

Take care not to damage any of the hydraulic tubes.

29. Remove the valve block with the swivel.

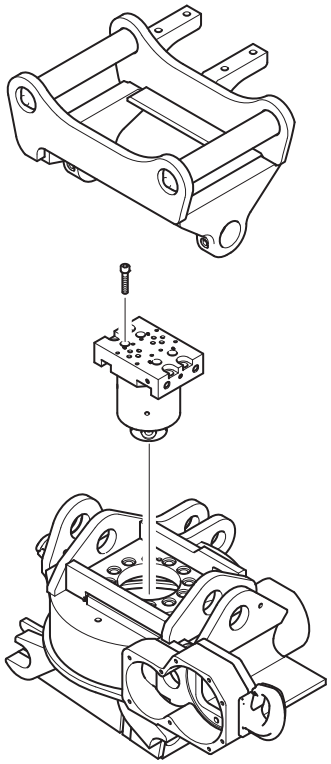


Fig. 22. Valve, swivel

30. Remove the screws for the centre ring.
31. Lift off the centre ring and the worm wheel.
32. Remove the shims
33. Remove the wear washer.
34. Check all wear parts for damage and wear. Replace any damaged or worn parts. Replace all seals. If there is too much play between worm screw and worm wheel, the play can be reduced by turning the worm wheel half a turn.

Attachment

1. Attach the wear washer, turning it so that it aligns with the lubrication holes in the frame. Use lock solution.

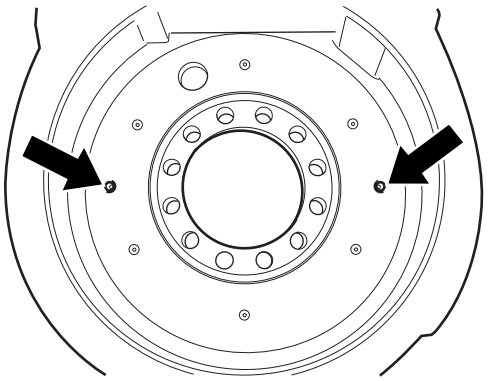


Fig. 23. Lubrication holes in frame

2. Attach shims.
3. Check that the lubrication hole is aligned with the hole in the shim.

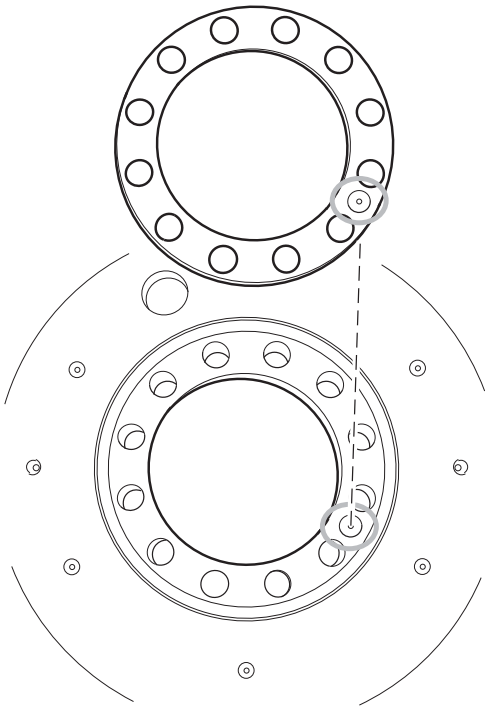


Fig. 24. Lubrication hole in shim

4. Attach the worm wheel.

NB:

The lubrication groove in the centre ring should be aligned with the lubrication holes in the frame.

5. Attach the centre ring and tighten the screws gradually, alternating between them.

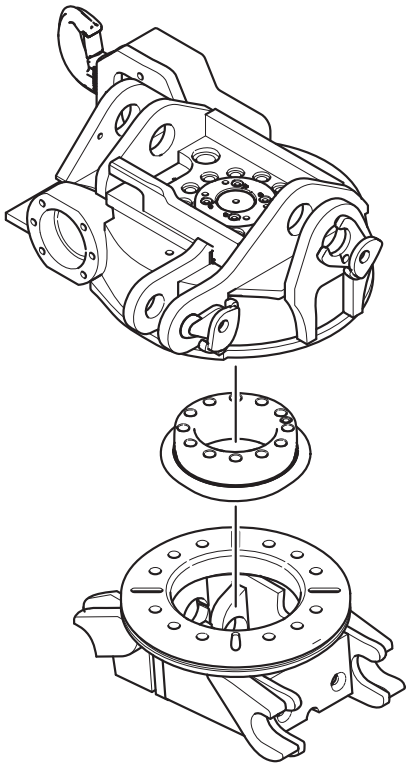


Fig. 25. Centre ring

6. Measure the axial play, using a dial indicator and iron bar. Readjust the shims if necessary.

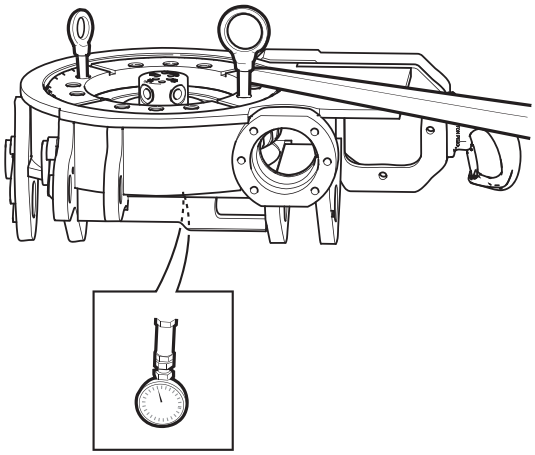


Fig. 26. Measurement of axial play

7. Attach the valve block with the swivel, turning the connections away from the machine.

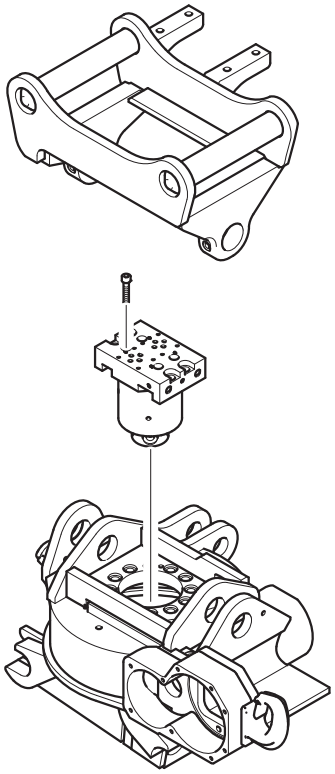


Bild 27. Ventilblock med svivel

NOTE:

Double seals.

8. Attach the tubes for extra equipment to connection 3A and connection 3B on the swivel.

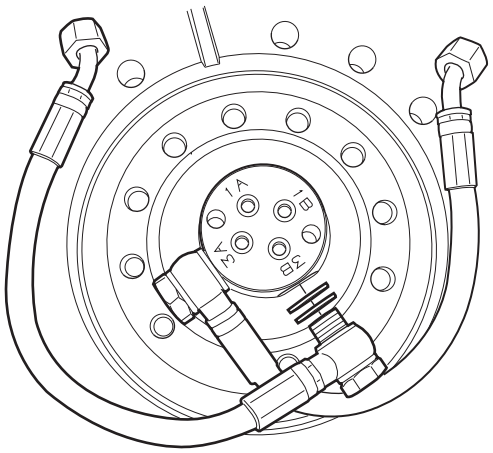


Fig. 28. Hydraulic tubes, swivel

NOTE:

Double seals.

9. Attach the tubes for the lock cylinder, following the markings made earlier.

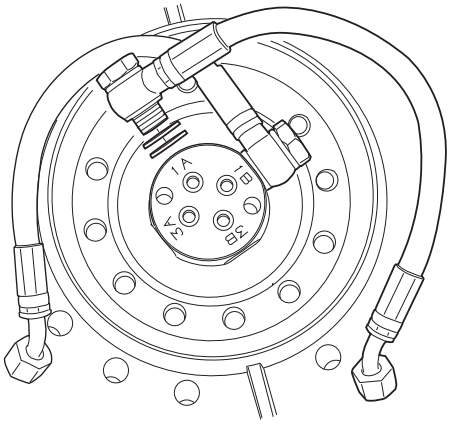


Fig. 29. Hydraulic tubes, swivel

10. Attach a new O-ring on the hitch.
11. Check that all fl at wedges are correctly in place.

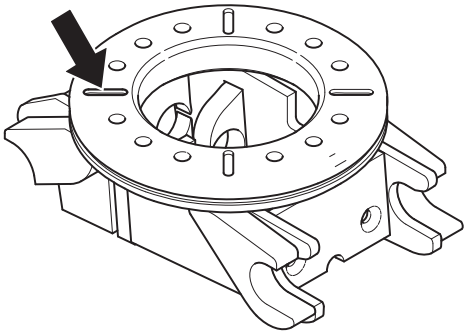


Fig. 30. Flat wedges

12. Lubricate the O-ring.
13. Attach the hitch for extra equipment, making sure that it is turned away from the machine.
14. Attach the screws for the hitch and tighten them gradually, alternating between them.
15. Attach the tube from connection 3A to the right-hand coupling on the hitch. Connect the tube from 3B to the left-hand coupling on the hitch.

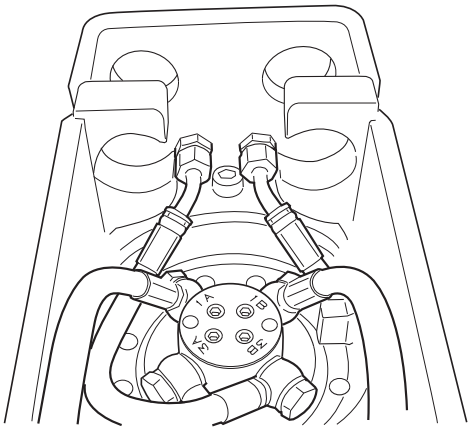
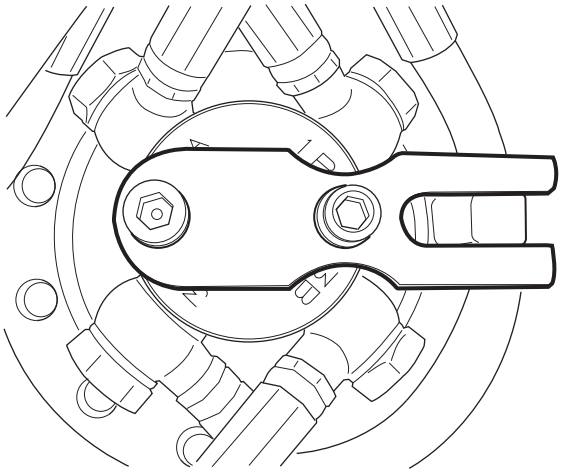


Fig. 31. Tubes for extra equipment, on hitch

16. Attach the carrier grab. It should be facing outwards between the B outlets.



BFig. 32. Carrier grab

17. Attach the latch bolts with the lock cylinder.
18. Attach the hydraulic tubes to the lock cylinder, following the markings made earlier, and put it into place.

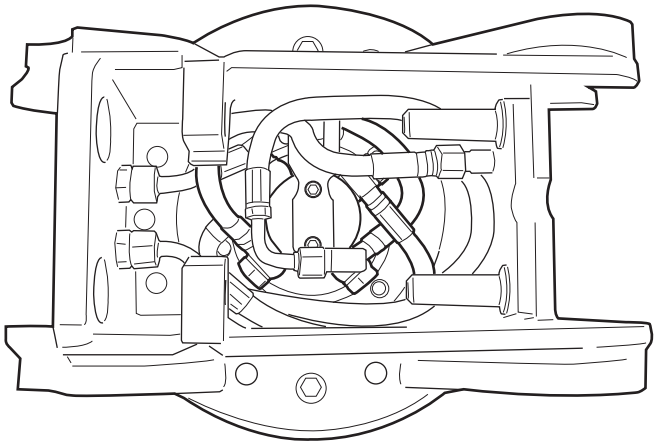


Fig. 33. Tubes, lock cylinder

19. Attach the tool springs, using a suitable tool to guide them into place.
20. Attach the screws for the lock cylinder and tighten them.

NB:

The guide pin in the frame should be aligned with the notches in the support ring and the axial washer.

21. Attach the support ring and the axial washer..

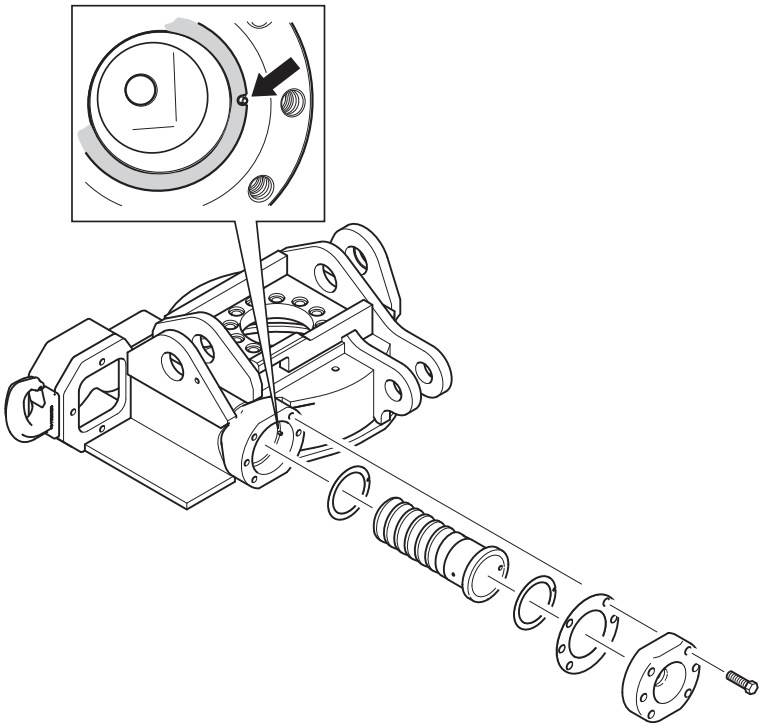


Bild 34. Styrstift stomme

22. Attach the worm screw. Make sure that the support ring and the axial washer do not slip out of place..

NB:

The guide pin in the screw housing should be aligned with the axial washer.

23. Attach the axial washer, the shims and the screw housing for the worm screw.

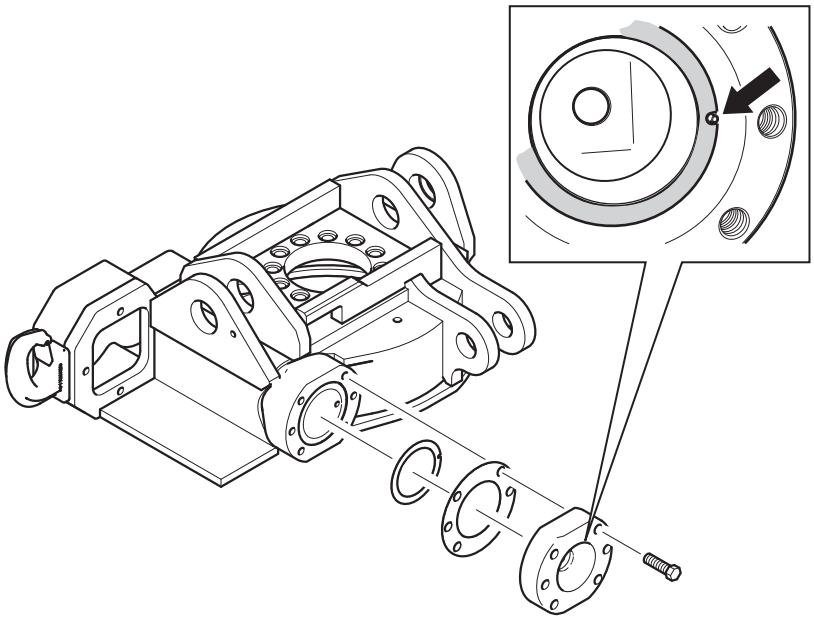


Fig. 35. Guide pin, screw housing

24. Attach the cog wheel for the worm screw.
25. Measure the axial play, using a dial indicator and an iron bar. Readjust the shims if necessary.

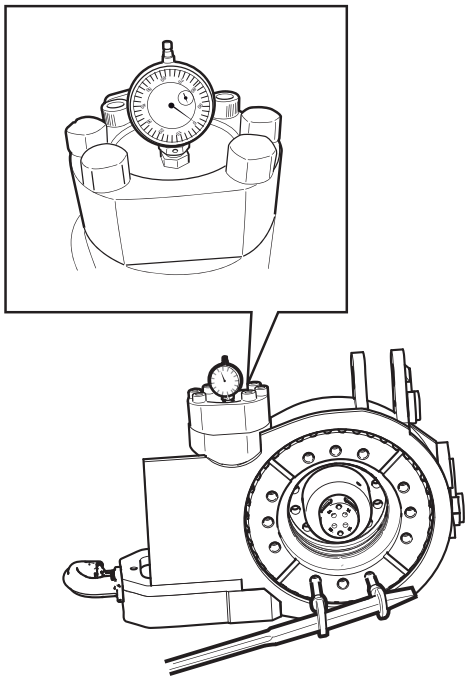


Fig. 36. Installation, dial indicator

26. Pull the three power plugs through the notch in the frame to the frame's directional valves.

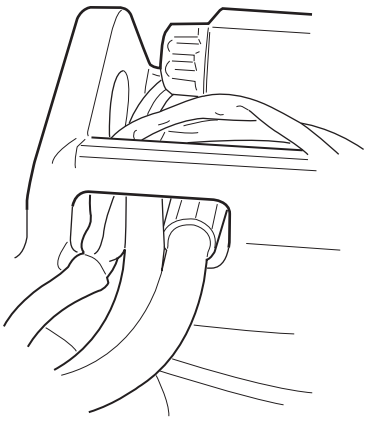


Fig. 37. Notch in frame

27. Connect the hydraulic tubes to the frame's valve package.

NOTE:

There are double seals on the banjo screw.

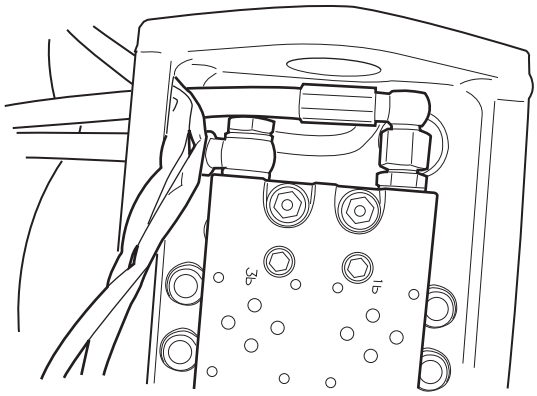


Fig. 38. Tubes for valve package, frame

28. Connect the directional valve to the frame's valve block.
29. Connect the power plugs to the directional valves, following the markings made earlier.

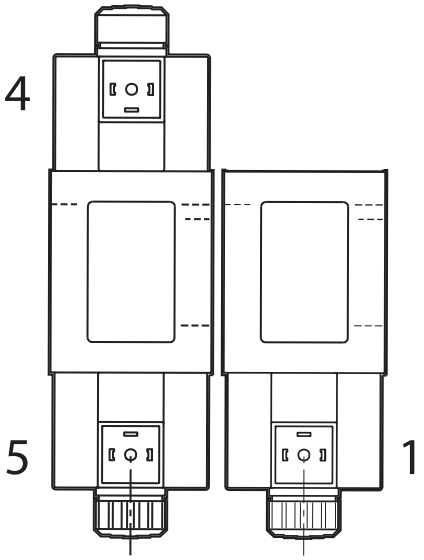


Fig. 39. Marking, power plugs (variations may occur)

30. Replace the head and attach the tilt shaft that is turned away from the machine. Check that the hole in the tilt shaft aligns with the lock screw in the frame.
31. Attach the tilt shaft that is turned towards the machine and push it in until it reaches the inner edge of the shaft hole in the head.
32. Shim the head into place, positioning the shims on the inside turned towards the machine.

NOTE:

There must be no perceivable play after attachment and shimming.

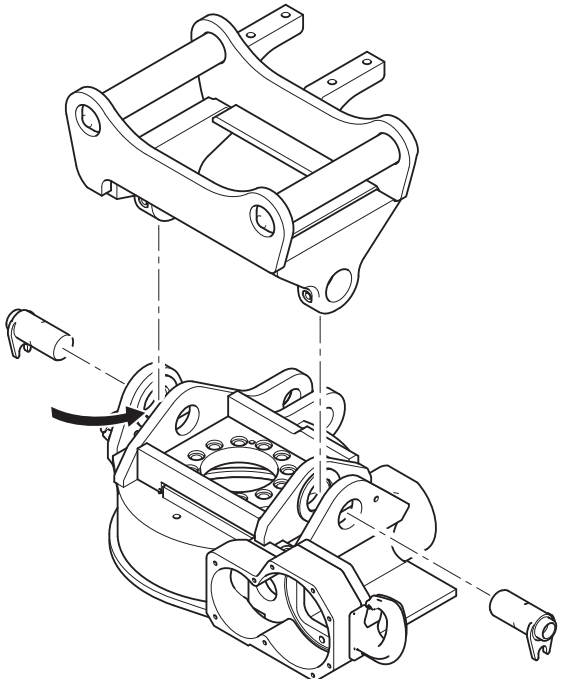


Fig. 40. Shimming

33. Attach the lock screw for the tilt shaft to the machine.
34. Attach the tilt cylinder in the yoke coupling that is turned towards the machine, and screw the yoke coupling that is turned away from the machine into place.

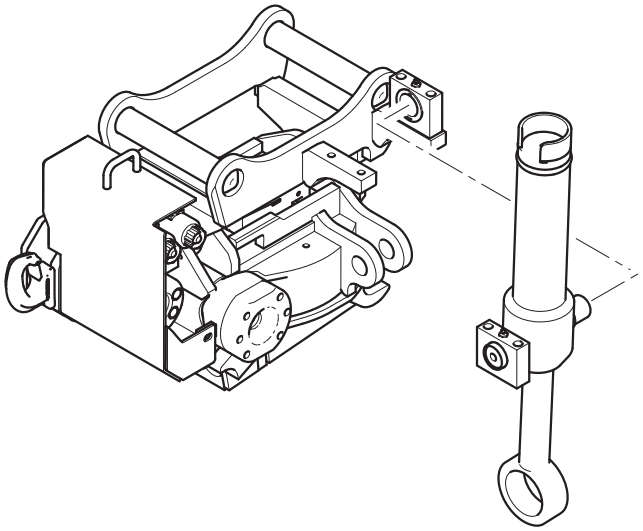


Fig. 41. Tilt cylinder

35. Attach the cylinder axle and its lock screw.
36. Attach the hydraulic motor with the valve package.
37. Attach the hydraulic tubes, following the markings made earlier.
38. Attach the motor's cog wheel.
39. Attach the gear housing.
40. Connect the power plugs on the motor's directional valves, following the markings made earlier.

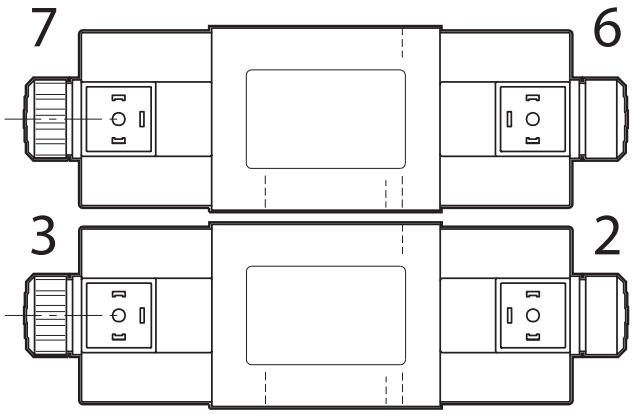


Fig. 42. Marking, power plugs (variations may occur)

41. Attach the motor guard.
42. Perform steps 1–5 according to the instructions in the section Tilt cylinder, Attachment.

Shimming

CAUTION

Make sure that the hydraulic system is free of pressure before starting work. Risk of personal injury.

NB:

All work that involves opening up connections to hydraulic parts requires a high degree of cleanliness.

1. Perform steps 1–5 according to the instructions in the section Worm screw, Removal.
2. Mark the positions of the power plugs on the frame's directional valves, then disconnect them.
3. Remove the directional valves.
4. Plug all open connections.
5. Mark the positions of the hydraulic tubes on the frame's valve package, then disconnect them.
6. Remove the frame's valve package by disconnecting the swivel.
7. Plug all open connections..
8. Undo the screws for the centre ring..

NOTE:

Take care not to damage the swivel.

9. Remove the frame.
10. Remove the shim.
11. Check all wear parts for damage and wear. Replace if necessary. Replace any worn or damaged seals.

12. Attach the shim. Check that the lubrication hole is aligned with the hole in the shim.

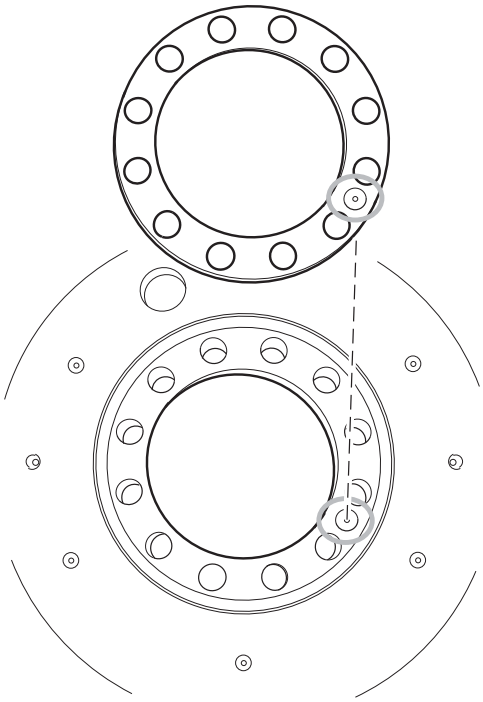


Fig. 43. Lubrication hole in shim

NOTE:

Take care not to damage the swivel.

13. Attach the frame.
14. Attach the screws for the centre ring and tighten them gradually, alternating between them.
15. Connect the swivel with the frame's valve package.
16. Measure the axial play according to the instructions in the section Axial play, worm wheel.
17. Connect the hydraulic tubes to the frame's valve package, following the markings made earlier.
18. Attach the directional valves.
19. Connect the power plugs on the directional valves, following the markings made earlier.
20. Perform steps 1–4 according to the instructions in the section Worm screw, Attachment.
21. Attach the gear housing.

Reverse assembly

Reverse dismantling and assembly is performed in the same way as normal dismantling and assembly, except that the plug in the frame is used to detach the hitch.

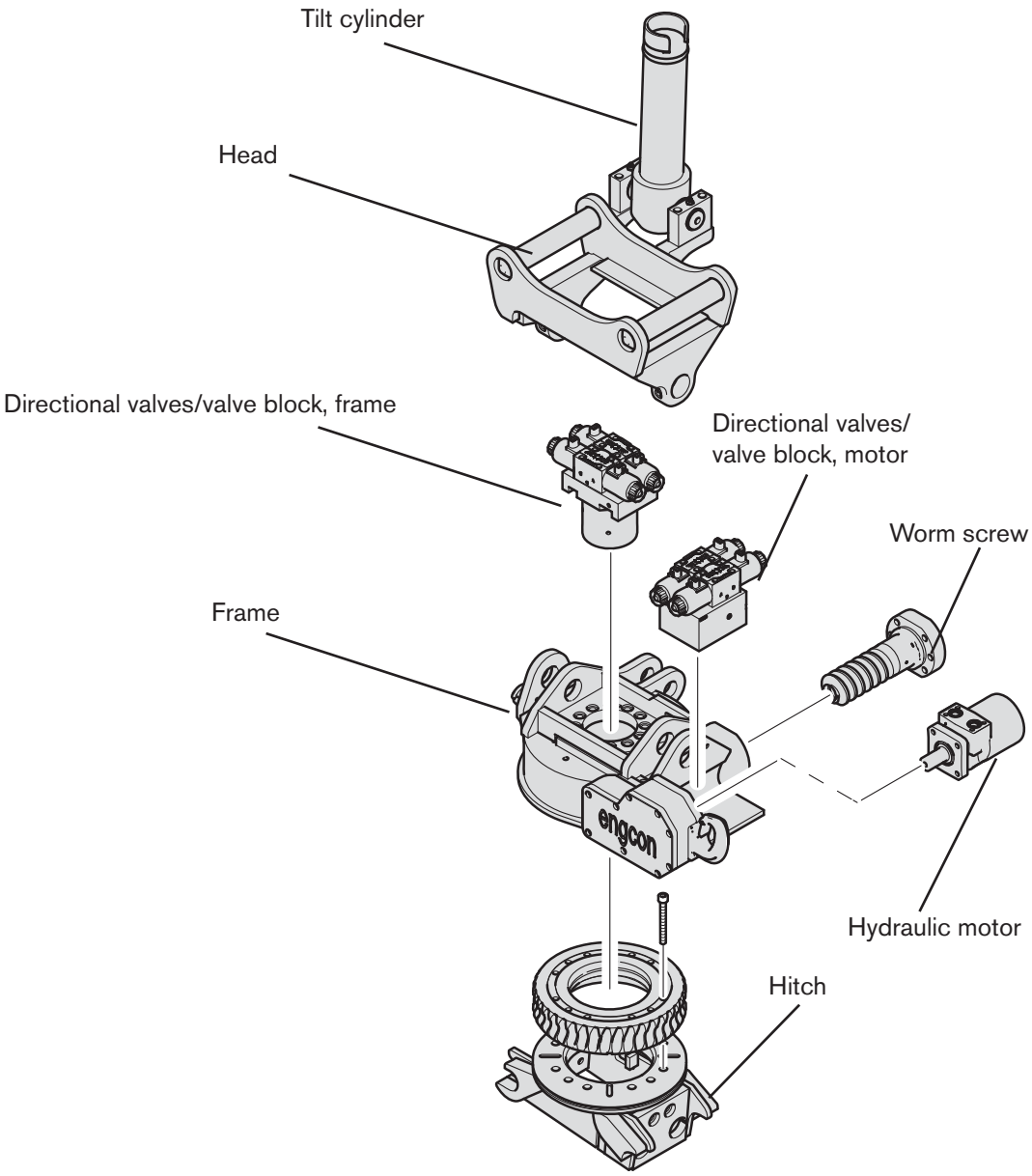


Fig. 44. Assembly diagram, reverse assembly

Checking of axial play

Axial play, worm wheel

CAUTION

Make sure that the hydraulic system is free of pressure before starting work. Risk of personal injury.

NB:

All work that involves opening up connections to hydraulic parts requires a high degree of cleanliness.

1. Disconnect the tube with an angle connection on the frame's valve block. Plug the connections.
2. Remove the plug in the frame and attach the gauge for checking the axial play.

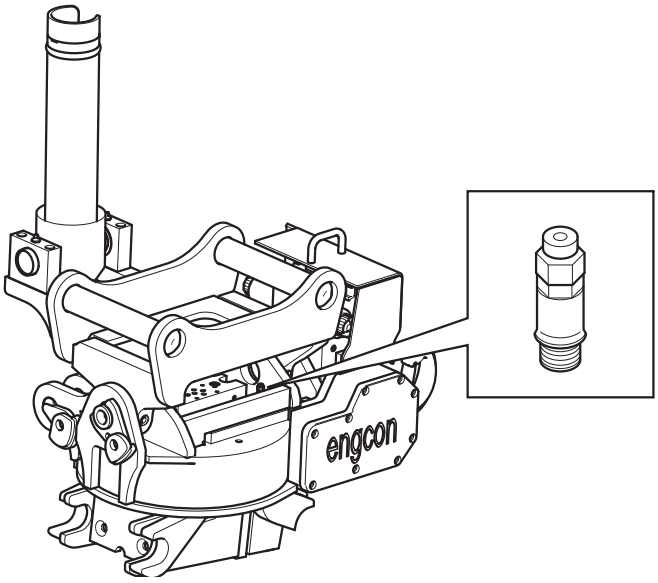


Fig. 45. Gauge for checking play

3. Set the gauge to zero, resting it against one of the fl at surfaces with the rotator resting fl at against the supporting surface.
4. Check the play by lifting the rotator up from the supporting surface. Probe with an iron bar between the hitch and frame to make sure that there is room for maximum play. Check that the play is within the indicated tolerance. If there is too much play, the rotator must be reshimmed.
5. Reshim according to the instructions in the section Worm wheel, Shimming.
6- Remove the gauge and attach the plug in the frame.
7. Attach the hydraulic tube with an angle connection to the frame valve block.

Axial play, worm screw

1. Remove the grease nipple in the screw housing for the worm screw.
2. Turn the lower part clockwise to make sure that the worm screw reaches the bottom.
3. Attach the gauge and reset it to zero against one of the fl at surfaces.

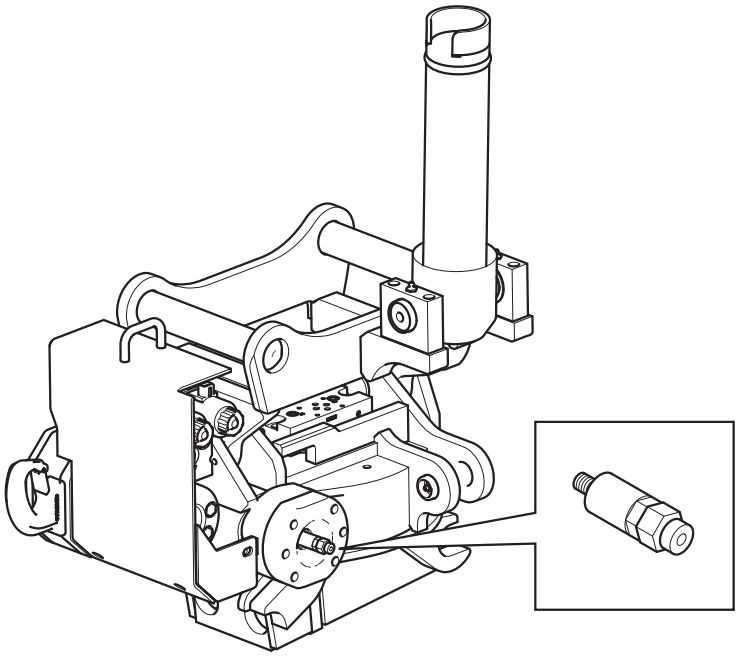


Fig. 46. Gauge for checking play

NOTE:

When checking the play, make sure that the lower part and frame do not rotate in relation to each other.

4. Turn the lower part anti-clockwise and check that the play is within the specified tolerance. If there is too much play, the worm screw must be reshimmed.
5. Reshim according to the instructions in the section Worm screw, Removal/attachment.
6. Remove the gauge and install the grease nipple in the screw housing for the worm screw.

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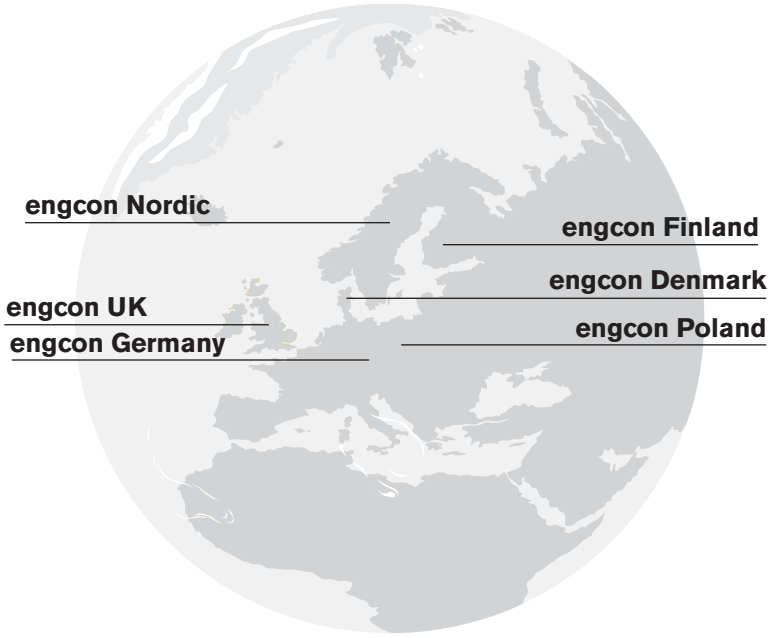

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